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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,119	02/10/2004	Robert A. Orzell	BUR920030192US1	2118

30449 7590 07/22/2008

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EXAMINER	
DANNEMAN, PAUL	
ART UNIT	**PAPER NUMBER**
3627	
MAIL DATE	**DELIVERY MODE**
07/22/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/708,119	ORZELL ET AL.	
	Examiner	Art Unit	
	PAUL DANNEMAN	3627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10 Feb 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. This action is in response to the application filed on 10 February 2004.

2. Claims 1-30 have been examined.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims 1-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dangat et al, US 5,792,585 hereafter known as Dangat.

6. **Examiner's note:** Examiner has pointed out particular references contained in the prior art of record in the body of this action for the convenience of the Applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply. Applicant, in preparing the response, should consider fully the **entire** reference as potentially teaching all or part of the claimed invention, as well as the content of the passage as taught by the prior art or disclosed by the Examiner.

As per Claims 1, 15 and 29, Dangat in at least Column 4, lines 55-67 discloses a computer implemented decision support tool generating a best-can-do (BCD) match between existing assets and demands across multiple manufacturing facilities to insure delivery commitments are met in a timely fashion. Dangat in at least Column 6, lines 5-9 further discloses converting the BCD solution into a "pegging" report format thereby providing a superior supply chain analysis.

Dangat in at least Column 6, lines 10-26 still further discloses assets include, but are not limited to, planned STARTS (starts at the lower level of the BOM), WIP (work in progress), inventory, purchases, and capacity. Demands include, but are not limited to, firm orders, forecasted orders and inventory buffer. The matching between existing assets and demands must take into account manufacturing specifications and business guidelines. Manufacturing specifications and process flows include, but are not limited to, build options, BOM (bill of material), yields, cycle times, receipt dates, capacity consumed, capacity available, substitutions (allowable substitutions), binning or sorting and shipping times. Business guidelines include, but are not limited to, frozen zones, demand priorities, priority trade-offs, preferred suppliers, and inventory policy. Build options, BOM, yields, cycle times, capacity, allowable substitutions, binning, inventory policy and supplier preferences are date effective.

Dangat in at least Column 10, lines 66-67 and Column 11, lines 1-11 discloses establishing low level code information to insure the heuristic implode step proceeds in the appropriate order. Dangat in at least Column 11, lines 40-57, Column 12, lines 30-53 and Column 12, lines 54-67 discloses additional uses of the low level code.

Dagnat lack the explicit teaching of a feasible schedule.

It would have been obvious, at the time of the invention, to one of ordinary skill to modify Dangat's BCD decision support tool's use of assets (BOMs, customer schedules, inventory and availability of capacity and components), demands (STARTS, WIP, inventory, purchases, capacity, firm customer orders, forecasted orders and inventory buffer), manufacturing specifications and process flows (build options, BOMs, yields, cycle times, receipt dates, capacity consumed, capacity available, substitutions, binning or sorting and shipping times), and business guidelines with a scheduling component to create a feasible schedule in order to increase management effectiveness.

As per Claims 2, 3, 16, and 17, Dangat in at least Column 9, lines 1-10 discloses the MRP component of BCD moving backwards through the production specification files and asset files to calculate exploded, interplant transfer, and substitution demand and total demand on every part number/location necessary to support the required demand. Dangat in at least Column 10, lines 1-15 further discloses that if the maximum numbers of chips required for a product with the highest demand (adjusted for yield) are manufactured there will be sufficient numbers of co-product chips to meet the demands for those requirements as well. Dangat further discloses that some chips can be substituted for other chips to meet their demand (i.e. supplying a FAST chip where a SLOW chip is required.). Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill in the art that Dangat's BCD system with a scheduling component (as modified in the Claims 1, 15 and 29 above) is able to create a feasible schedule for products built from or sharing a common component and the substitution of components to meet the actual and anticipated customer demand.

As per Claims 4, 5, 18 and 19, Dangat in at least Column 8, lines 46-67 discloses that the BCD system has a "pegging" or supply chain analysis component which converts the solution into a pegging report that explains the solution and has a look and feel with which production planning people are familiar with. Dangat further discloses that BCD system has an MRP with special logic to (a) avoid over building binned parts. Clearly Dangat attempts to prevent overbuilding which results in unused binned components. Dangat in FIG.2 and Column 9, lines 1-10 discloses the MRP component of BCD moving backwards

through the production specification files and asset files (inventory and WIP or receipts) to calculate exploded, interplant transfer and substitution demand and total demand on every part number/location necessary to support demands with priorities block 201 of FIG. 2. Dangat uses inventory (excess binned components which resulted from “overbuilding”, canceled customer orders, etc.), WIP and receipts to adjust the required STARTS and "pegging" of the BCD solution similar to Applicant’s generation of additional demand pegging records for unused binned components.

As per Claims 6 and 20, Dangat in at least FIG.2, Column 8, lines 59-67 and Column 9, lines 1-10 discloses a STARTS file for parts that have no further bill of material (reverse low level code of 1, often wafer STARTS in semiconductor manufacturing). Dangat in at least FIG.3, Column 9, lines 12-26 further discloses the MRP process of the BCD tool beginning by calculating the low level code for all part numbers and the classification of each part as binned or non-binned and when all parts have been processed, reports and files are consolidated in block 309. Dangat in at least Column 9, lines 26-38 further discloses that the MRP component of the BCD uses traditional logic well known to anyone practiced in the art of moving backwards through the BOM according to low level code.
Dangat in at least FIG.2, Column 10, lines 66-67 and Column 11, lines 1-11 discloses establishing low level code information to insure the heuristic implode step proceeds in the appropriate order. Dangat further discloses that for purposes of further discussion, defines a part number to have a reverse low level code of one if it has no components. Dangat in at least Column 11, lines 40-57, Column 12, lines 30-53 and Column 12, lines 54-67 discloses additional uses of the low level code.

As per Claims 7 and 21, Dangat in at least Column 1, lines 23-30 discloses four decision or scheduling tiers common in semiconductor manufacturing. Dangat in at least Column 1, lines 47-59 discloses a first tier dealing with strategic scheduling which is driven by the time frame or lead time required for the business plan, resource acquisition, and new product introduction. Dangat in at least Column 1, lines 66-67 and Column 2, lines 1-16 further discloses a second tier dealing with tactical scheduling which addresses the problems the company faces in the next week to six months. Items such as yields, cycle

times, binning percentages, permissible substitutions and the scheduling of starts or releases into manufacturing, delivery dates for firm orders, order/release plans and reschedules are estimated, generated and planned. Dangat in at least Column 2, lines 16-29 further discloses a third tier called operational scheduling which deals with the execution and achievement of a weekly plan, shipments are made and tools used to support the activities are decision support, recovery models, prioritization techniques and deterministic forward schedulers. Dangat in at least Column 2, lines 30-52 still further discloses a fourth tier or dispatch scheduling tier which addresses problems of the next hour to a few weeks by responding to conditions as they emerge in real time and accommodates variances from availability assumed by systems in the plan creation and commitment phases.

Dangat in at least Column 11, lines 4-11 further discloses the BCD engine permitting the user to modify STARTS, RECEIPTS, and CAPACITY AVAILABLE prior to executing the forward or implode component which generates the feasible schedule, plan, or match. Dangat in at least FIG.2 and Column 22, lines 1-14 further discloses that the report issued in block 220 shows the details of any customer order with respect to the part, and the recommended shipment schedule, if any, as a result of the latest BCD run. The shipment schedule is followed by a series of supply chain information leading to the shipment schedule. The supply chain information includes part (component) numbers, date the (independent or dependent) demand for a part (component) numbers, date the (independent or dependent) demand for a part (component) is satisfied, how and how much of the demand is satisfied (e.g., from inventory, future receipts, intersite shipments, vendor shipments, substitutions, or production starts).

Dangat in at least FIG.9 and Column 22, lines 23-56 still further discloses customer shipment schedule being created from the NEWNEEDS file and into the NEWNEEDSTOT and assigning inventory of assets to the need of matching parts in the NEWNEEDS file on a first-in, first-out (FIFO) basis.

Dangat in at least Column 6, lines 10-26 still further discloses assets include, but are not limited to, planned STARTS (starts at the lower level of the BOM), WIP (work in progress), inventory, purchases, and capacity. Demands include, but are not limited to, firm orders, forecasted orders and inventory buffer. The matching between existing assets and demands must take into account manufacturing specifications and business guidelines. Manufacturing specifications and process flows include, but are

not limited to, build options, BOM (bill of material), yields, cycle times, receipt dates, capacity consumed, capacity available, substitutions (allowable substitutions), binning or sorting and shipping times. Business guidelines include, but are not limited to, frozen zones, demand priorities, priority trade-offs, preferred suppliers, and inventory policy. Build options, BOM, yields, cycle times, capacity, allowable substitutions, binning, inventory policy and supplier preferences are date effective.

Dangat in at least Column 10, lines 66-67 and Column 11, lines 1-11 discloses establishing low level code information to insure the heuristic implode step proceeds in the appropriate order. Dangat in at least Column 11, lines 40-57, Column 12, lines 30-53 and Column 12, lines 54-67 discloses additional uses of the low level code.

Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill that Dangat's BCD tool with a scheduling component (as modified in the Claims 1, 15 and 29 above) generates a feasible plan / schedule based on capacity, availability of assets and components (from internal and / or external suppliers), and demands.

As per Claims 8-14, 22-28 and 30, Dangat in at least Column 4, lines 55-67 discloses a computer implemented decision support tool generating a best-can-do (BCD) match between existing assets and demands across multiple manufacturing facilities to insure delivery commitments are met in a timely fashion. Dangat in at least Column 6, lines 5-9 further discloses converting the BCD solution into a "pegging" report format thereby providing a superior supply chain analysis.

Dangat in at least FIG.3, Column 9, lines 12-26 further discloses the MRP process of the BCD tool beginning by calculating the low level code for all part numbers and the classification of each part as binned or non-binned and when all parts have been processed reports and files are consolidated in block 309. Dangat in at least Column 9, lines 26-38 further discloses that the MRP component of the BCD uses traditional logic well known to anyone practiced in the art of moving backwards through the BOM according to low level code.

Dangat in at least FIG.2, Column 10, lines 66-67 and Column 11, lines 1-11 discloses establishing low level code information to insure the heuristic implode step proceeds in the appropriate order. Dangat further discloses that for purposes of further discussion, defines a part number to have a reverse low level code of one if it has no components. Dangat in at least Column 11, lines 40-57, Column 12, lines 30-53 and Column 12, lines 54-67 discloses additional uses of the low level code.

Dangat in at least Column 8, lines 46-67 discloses that the BCD system has a "pegging" or supply chain analysis component which converts the solution into a pegging report that explains the solution and has a look and feel with which production planning people are familiar with. Dangat further discloses that BCD system has an MRP with special logic to (a) avoid over building binned parts. Dangat in FIG.2 and Column 9, lines 1-10 discloses the MRP component of BCD moving backwards through the production specification files and asset files (inventory and WIP or receipts) to calculate exploded, interplant transfer and substitution demand and total demand on every part number/location necessary to support demands with priorities block 201 of FIG. 2.

Dangat in at least Column 1, lines 66-67 and Column 2, lines 1-16 further discloses a second tier dealing with tactical scheduling which addresses the problems the company faces in the next week to six months. Items such as yields, cycle times, binning percentages, permissible substitutions and the scheduling of starts or releases into manufacturing, delivery dates for firm orders, order/release plans and reschedules are estimated, generated and planned.

Dangat in at least Column 11, lines 40-57 further discloses the output of the BCD MRP block establishing a list of required starts (part identification, quantity, start date, and priority) for parts which have no further bill of material; that is having reverse low level code of one in block 208 and modifying or adjusting the start date for any one of or all the items in the STARTS file. Dangat in at least FIG.6 and Column 12, lines 30-53 further discloses adjusting (delaying or accelerating) a start to deal with capacity issues, demand class and date.

Dangat in at least Column 6, lines 10-26 still further discloses assets include, but are not limited to, planned STARTS (starts at the lower level of the BOM), WIP (work in progress), inventory, purchases, and capacity. Demands include, but are not limited to, firm orders, forecasted orders and inventory

buffer. The matching between existing assets and demands must take into account manufacturing specifications and business guidelines. Manufacturing specifications and process flows include, but are not limited to, build options, BOM (bill of material), yields, cycle times, receipt dates, capacity consumed, capacity available, substitutions (allowable substitutions), binning or sorting and shipping times. Business guidelines include, but are not limited to, frozen zones, demand priorities, priority trade-offs, preferred suppliers, and inventory policy. Build options, BOM, yields, cycle times, capacity, allowable substitutions, binning, inventory policy and supplier preferences are date effective.

Dangat in at least Column 22, lines 57-60 discloses that the BCD tool allows the user to dynamically personalize the BCD to best meet the needs of the business situation. Dangat in at least Column 22, lines 61-67, FIG.10 and Column 23, lines 1-3 discloses a scenario where the user exercises all three major stages (backwards (explode), adjustment, and forward (implode) of the BCD tool), but only uses the heuristic implode component for situations where a set of products with simple product structures and either many parts or many days in the planning horizon.

Dangat in at least FIG.11 and Column 23, lines 4-10 further discloses a second scenario commonly used for runs on very large data sets, where only explode and implode are used and the user chooses not to make any adjustments to the STARTS file or the receipts file.

Dangat in at least FIG.12 and Column 23, lines 11-18 further discloses a third scenario used when the production planning group is attempting to determine their START plan for a time unit (month, three months, etc.) where the user runs the explode and creates and saved a required starts and receipts due date files and save. The user wished to run a set of “what-if” scenarios with different adjusted STARTS and receipts.

Dangat in at least FIG.13 and Column 23, lines 19-27 further discloses a fourth scenario used when there are a set of products with complex product structures (multiple processes and substitution) and either a reasonable number of parts and/or time buckets where the user exercises all three major stages (backwards (explode), adjustment, and forward (implode) of the BCD tool), but only uses the LP implode component and not the heuristic implode component or the adjust capacity step.

Dangat in at least FIG.14 and Column 23, lines 28-32 further discloses a fifth scenario where the user executes the LP implode engine in stand alone mode. The LP engine is capable of creating a feasible solution without a STARTS file and using the original receipts and capacity files in the input block.

Therefore, it would have been obvious, to one of ordinary skill that Dangat's BCD decision support tool with scheduling component (as modified in Claims 1, 15 and 29 above) uses MRP, Low Level Code, Pegging, Delayed Pegging, Inventory, Asset, Schedules, Substitute Components, etc. to match assets with demands to create a feasible schedule for a semiconductor manufacturing facility.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Rush et al., US 6,119,102 teaches an MRP System with Viewable Master Production Schedule.
- Hegde et al., US Pub 2003/0065415 A1 teaches a Decomposition System and Method for Solving a Large Scale Semiconductor Production Planning Problem.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL DANNEMAN whose telephone number is (571)270-1863. The examiner can normally be reached on Mon.-Thurs. 6AM-5PM Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Florian Zeender can be reached on 571-272-6790. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul Danneman/

Examiner, Art Unit 3627

12 July 2008

/F. Ryan Zeender/
Supervisory Patent Examiner, Art Unit 3627